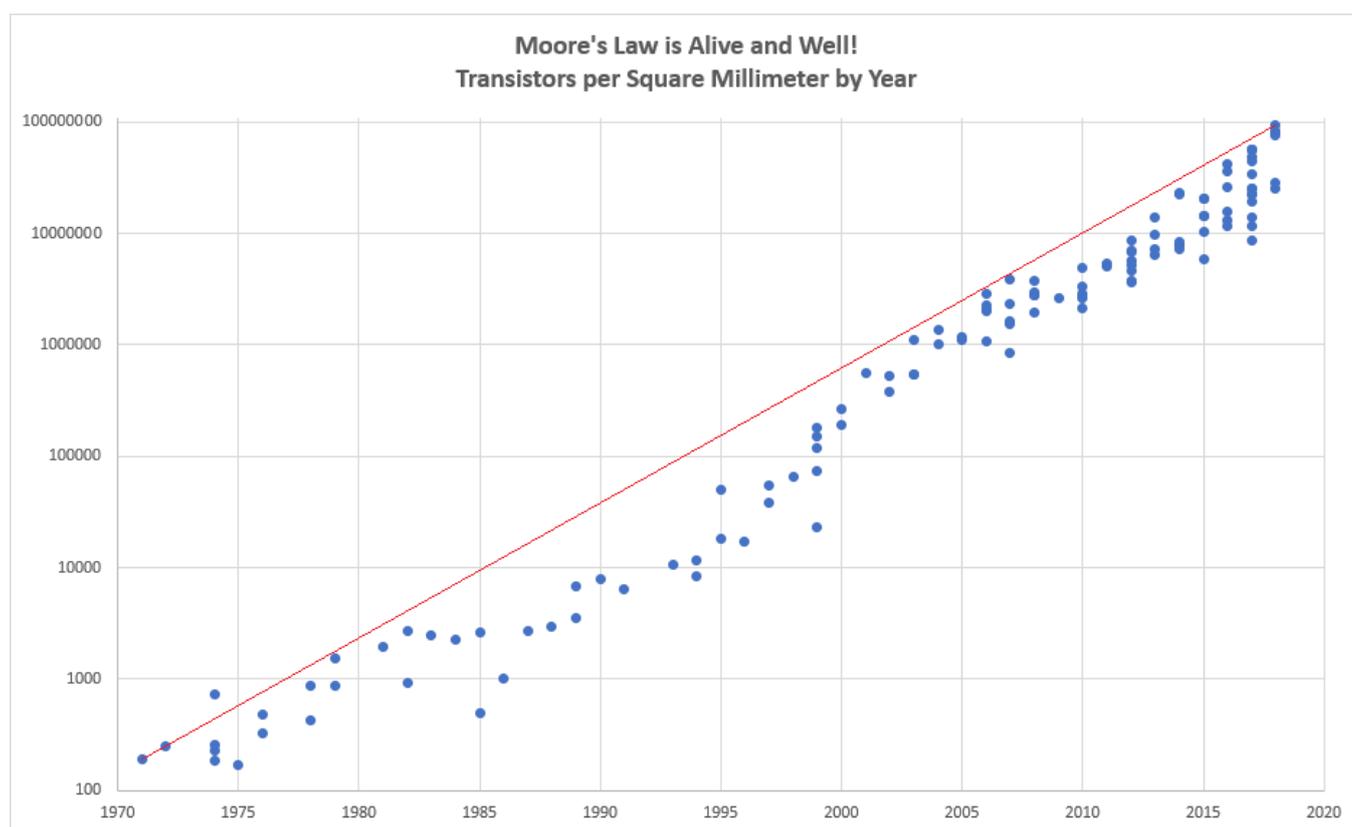


Moore's Law is Alive and Well

Charts show it may be dying at Intel, but others are picking up the slack.

[Eric Martin](#) Dec 22, 2018



Transistors per Square Millimeter by Year, 1971–2018. Logarithmic scale. Data from [Wikipedia](#).

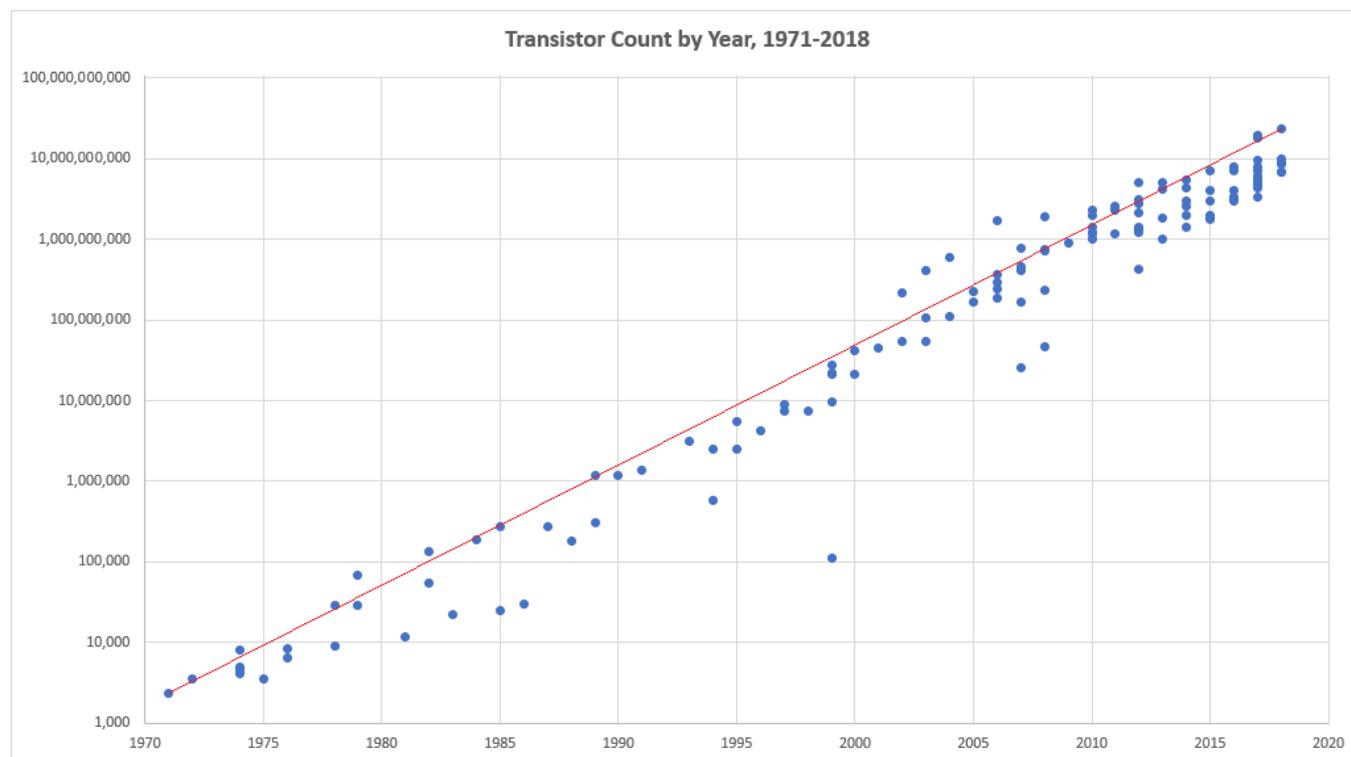
The chart above scatter plots all of the complete [data](#) from the microprocessor section of the "Transistor count" Wikipedia article. This is charted on a logarithmic scale for the vertical access. I added a line from the bottom left dot to the top right dot, for reference. As you can see, transistor density has been increasing at a fairly even exponential rate, even into 2018.

Right now the smallest process node in production is 7 nanometer (nm) from Taiwan Semiconductor Manufacturing Company (TSMC). But Samsung has announced process nodes all the way down to [3 nm](#), and

just yesterday we learned that TSMC is approved to build the world's first [3 nm](#) plant, with production of chips to [start](#) "in late 2022 or early 2023." To illustrate TSMC's dominance, consider that right now I think all 7 nm chips are made by TSMC, many or all 10 nm chips are made by TSMC, and Intel is still stuck around the 14 nm node, and that node has less transistor density than most or all processors from any manufacturer at the 10 and 7 nm nodes.

Moore's law is not dead. It may be dying at Intel, but TSMC and possibly Samsung are picking up the slack.

Moore's Law [states](#) that transistors on a chip double about every two years. Here's a chart with the same processors as the chart above but showing total transistor count instead of transistors per square millimeter. This is actually a better representation of how well Moore's Law is doing. I again added a straight line by going from the bottom left dot to the top right dot on the chart:



Transistor Count per Microprocessor by Year, 1971–2018. Logarithmic scale. Data from [Wikipedia](#).

Below is all of the raw data that I created these charts from. It's sorted by

transistor density. Merry Christmas!

Data from [Wikipedia](#).